

TECHNOLOGY STRATEGY (B8570)

Tuesdays and Thursdays, Room TBD

Section 001: 10:50 PM - 12:20 PMSection 002: 2:20 PM - 3:50 PM**Professor Dan J. Wang**dan.wang@columbia.edu, Office: Kravis Hall 952Office Hours:

Fridays (2:30 - 4 PM), and by appointment

Teaching Assistants:Brandon Freiberg, BFreiberg24@gsb.columbia.eduVivi Gregorich, GGregorich25@gsb.columbia.edu**COURSE OBJECTIVES AND DESCRIPTION**

This course provides an introduction to the strategic management of technology. *Technology Strategy* has three goals, which relate to the three modules of the course. The purpose of the first module, “Technology-based Competitive Advantage”, is to understand how technology affects firms’ profitability and growth. In the second module, “Technology Platforms and Network Dynamics”, we will examine how firms utilize technology to harness network effects, especially in the form of multi-sided platforms, to gain competitive advantage and capture value. The third module, “Technology Convergence and AI”, explores the opportunities and dilemmas created by technologies that recombine functions and services in novel ways, with an emphasis on the value-creating potential of artificial intelligence technologies. In our final module, “Technology Strategy and Society”, we will explore how technology can solve some social and business problems but can also create ethical dilemmas. Specific topics and questions include but are not limited to the following:

- How can firms commercialize and protect new innovations or scientific discoveries?
- How should an incumbent firm respond to “disruptive” innovations?
- How do firms leverage network effects to build sustainable competitive advantage?
- What are the optimal strategies for building multi-sided platforms?
- When do artificial intelligence technologies – both predictive and generative – confer competitive advantage?
- How do new technologies change the way we interact in society, and how should businesses respond?

PREREQUISITES AND CONNECTION TO THE CORE

Prior to taking Technology Strategy, students must have completed Strategy Formulation (B6502). We will use and extend concepts covered in Strategy Formulation. The class will specifically build on concepts such as value propositions (Brooklyn Brewery, Walmart, and Zara cases), diversification (Disney case), network effects (Apple case), the player analysis framework (Airbus vs. Boeing and Maersk cases), and two-sided platforms (Jumia and Uber (A) cases). The class will also integrate material from Marketing, Managerial Economics, Business Analytics, and Operations Management.

REQUIRED COURSE MATERIALS AND READINGS

All cases, required readings, and videos will be made available via links in the Calendar section of the course Canvas page. There is no physical casebook for this course. There are several *optional* books that are relevant to that you might find helpful as well in preparation for those sessions.

Optional, but Highly Recommended Readings

- Agrawal, Ajay, Joshua Gans, and Avi Goldfarb. 2022. *Power and Prediction: The Disruptive Economics of Artificial Intelligence*.
- Chen, Andrew. 2021. *The Cold Start Problem: How to Start and Scale Network Effects*. Harper Business.
- Kearns, Michael and Aaron Roth. 2019. *The Ethical Algorithm: The Science of Socially Aware Algorithm Design*. Oxford University Press.
- McAfee, Andrew and Erik Brynjolfsson. 2017. *Machine, Crowd, Platform: Harnessing our Digital Future*. WW Norton.

COURSE ADMINISTRATION AND GRADING

Grading will be based on the components and weights below to calculate your course grade. All of the graded components below are individual of type C vis-à-vis the honor code:

1. Class Participation	40%
2. Two Class Write-ups	15%
3. Autonomous Vehicles Assignment	5%
4. Optional Final Project	30%

A student who only participates actively in class, submits all poll question assignments, and does a good job on the two case write-ups and autonomous vehicles data assignment can receive a maximum grade of HP. Students who wish to receive an H must also submit an individual final project as described below in addition to the other requirements. There is no reason to do a final project unless you are going to put forth a serious effort on all components of the grade.

AI (Artificial Intelligence) Assistance Policy

The use of generative AI tools, such as OpenAI’s ChatGPT, to complete your assignments *is permitted* in this class; in fact, *it is encouraged* as long as it improves the quality of your work and does not inhibit or misrepresent your thinking and reasoning. For some assignments, the use of generative AI tools is required. The main purpose of the writing assignments below is to help you prepare for in-class discussion, during which you will be called upon to share your thoughts, hear from others, react, and revise or defend your thinking. **The only requirement is that when you do use an AI tool to generate text for your poll question or write-up response, please note it in your response by appending the following text: [Partially generated by AI] - or - [Entirely generated by AI]**

1. Class Participation

Your participation is essential for both your own learning and that of other students. Because Technology Strategy is a case-based course, most of the learning will take place in our class discussion of these very cases. I expect that every student will arrive having done the required readings and able to answer the day’s assignment questions. Students should also expect to be cold called in class. 40% of your overall course grade will be your participation grade, which is further decomposed into three components: 1) Poll question completion (10%), 2) Frequency and Quality of participation in class discussion (25%), 3) Slack discussion (5%).

Poll question: There is one poll question for each case and guest speaker in class (starting with session 2, and with the exception of session 4). Poll questions will be posted as assignments in your Canvas Calendar. They require you to read the relevant case or article and give a short response to 1-2 questions. For some poll questions, the short response portion of the poll question will ask you to interact with a custom generative AI conversation

platform, and you will be asked to cut and paste the output of your conversation. *You must submit your answer to the poll question through Canvas by 9 AM on the day the relevant case or guest speaker is scheduled for class.* **If are you submitting a class write-up (see below) that addresses the poll question, you must still submit an answer to the multiple choice question(s), but you may write “Please see write-up” in the short response section.**

Frequency and quality of class participation: Both the frequency and quality of your class participation will be affected by non-attendance. Obviously, not coming to a class means that you will not have a chance to take part in class discussion, which is a critical component of your overall grade. *In terms of quality, the best class comments:*

- Articulate a clear stance or argument
- Raise issues from past classes, current events, or other anecdotes that are relevant to the discussion
- Show curiosity and a willingness to experiment
- Use data, examples, or your own personal and professional experience to support arguments
- Are respectful when disagreeing by summarizing the contravening opinion before delivering your own

If you are comfortable with participating in class, I encourage you to help others feel safe about participating by inviting further discussion or referring to points that have already been made by your classmates. Students are also expected to be present, prepared, and participate per the Columbia Core Culture. For excused absences, please submit the OSA administered survey on Canvas before the session you have to miss to make sure that your participation grade does not suffer. Use of electronic devices in class is not allowed except in answering Poll Everywhere questions during class.

2. Two Class Write-Ups

You must complete **two (2) write-ups**, each of which can take one of two forms. 1) Prepare a case write-up for sessions in which we discuss specific cases. 2) Prepare a guest speaker write-up for sessions in which we have guest speakers. A write-up should address either the “Guiding Questions” posted in your Canvas Calendar about the case, or it can be a deeper analysis of the poll question posed for the class. Case write-ups should analyze and persuade rather than recite facts. Also, for guest speakers, your write-up should summarize what you believe to be a key strategic problem that the guest speaker’s company or industry is facing, or a reflection about the readings provided in preparation for the guest speaker. Each write-up should not exceed 600 words, which is approximately equivalent to 2 pages at 12-pt Times New Roman font with 1-inch margins.

If your class write-up focuses on the poll question for the session, please submit a response to the poll question with a note directing me to your class write-up (for example, “Please see my class write-up that addresses this poll question.”)

You may do two case write-ups, two guest speaker write-ups, or one of each. Please indicate the two sessions for which you plan to do write-ups via the survey link on Canvas by **Thursday, September 7** (you are not obligated to stick to these choices). Write-ups should be uploaded to Canvas by 9 AM on the day the relevant case or guest speaker.

3. Autonomous Vehicles Assignment

There is a data-related exercise that you should complete prior to our session on Autonomous Vehicles (**Tuesday, November 28**). You’ll find all of the relevant materials in a folder in the “Files” section of Canvas called “Autonomous Vehicles Assignment.” The assignment will walk you through the process of analyzing a dataset collected from a survey of American adults about their attitudes toward autonomous vehicles. Your familiarity with the dataset and the insights you will glean from completing the assignment will form the basis of a discussion that we will have in class, so it is imperative that you complete the assignment.

4. Optional Final Project

The final project is for students hoping to receive an H in the course. However, doing a final project does not guarantee that a student will receive an H, and receiving an H also requires doing well in participation and the two write-ups.

For the final project, I ask that you analyze and evaluate a particular strategic decision or (set of decisions) facing a company or industry using the concepts from the course (essay form, 1,800 word limit, including all exhibits). While providing some details is necessary, you should emphasize analysis over description. Do not use cases covered in this course or other courses at Columbia Business School. You are welcome to make use of industry contacts. I am also happy to provide a real-world 'case' if you have trouble deciding on your own.

Students who wish to do a final project must sign up on Canvas by **Thursday, October 10** to confirm the project's topic. Not signing up with a proposal by **Thursday, October 10** means that you will not have an opportunity to submit a final project. Discussing your topic with me in advance is advised but not required. The optional final project is due on **Thursday, December 14, at 11:59 PM.**

CLASS SESSIONS: September 5 - October 12, 2024

Session	Date	Module	Key Topics	Cases and Readings*	Assignments Due
1	5-Sep	Technology-based Competitive Advantage	Introduction and Overview	Tinder: From Swiping Right to Scaling Up (Read Case)	Poll Question
2	7-Sep		Protecting Innovation	Lego: Publish or Protect? (Read Case, Watch Videos)	Poll Question, Class Write-up Survey
3	12-Sep		Disruptive Innovation	Netflix: Continuous Innovation or Self Destruction? (Read Case)	Poll Question
4	14-Sep		Managing Innovation	Food Truck Challenge Group Exercise (No Case Reading)	
5	19-Sep		Technology Lifecycles	Rivian: Powering Up or Losing Charge in the EV Market (Read Case)	Poll Question
6	21-Sep		Self-Disruption Strategy	Anticipating Disruption Group Exercise (No Case Reading)	
7	26-Sep	Technology Platforms and Network Dynamics	Platform Synergies	LinkedIn Learning: Strategy Tradeoffs at a Multi-Sided Platform Firm (Read Case)	Poll Question
8	28-Sep		Platform Competition	Uber: New Roads Ahead (Read Case)	Poll Question
9	3-Oct		Enterprise Platforms	Digital Ocean: Finding a Fresh Strategy for Cloud Computing	Poll Question
10	5-Oct		Platform Design	Guest Speaker: Stephanie Danzi (SVP and Head of Global Marketing, Tinder)	Poll Question
11	10-Oct		Platform Initiation	Alphabet (Read Case)	Poll Question
12	12-Oct		Mid-semester review	Platform Leadership Group Exercise (No Case Reading)	Optional Final Project Proposal

* **Blue** denotes Columbia Case.

CLASS SESSIONS: October 24 – December 7, 2023

Session	Date	Module	Key Topics	Cases and Readings*	Assignments Due
13	24-Oct	Technology Convergence and Artificial Intelligence	Media Convergence	Twitch: Monetizing and Moderating Livestreaming (Read Case)	Poll Question
14	26-Oct		Social Convergence	Kakao's Super-App Strategy (Read Case)	Poll Question
15	31-Oct		Advantage through AI	Artificial Intelligence at StitchFix (Read Case)	Poll Question
16	2-Nov		Implementing AI	Hubspot and Motion AI: A Chatbot-Enabled CRM (Read Case)	Poll Question
17	9-Nov		Organizing around AI	Mastercard's Organizational Structure: The Making of a New AI Powerhouse (Read Case)	Poll Question
18	14-Nov		Generative AI	Guest Speaker: Cris Valenzuela (Founder and CEO, RunwayML)	Poll Question
19	16-Nov		Generative AI	Collaborating with AI Group Exercise (No Case Reading)	
20	21-Nov		NO CLASS	NO CLASS	
21	28-Nov	Technology Strategy and Society	Technology Stakeholders	Autonomous Vehicles (Read Case)	Poll Question, AV Data Exercise
22	30-Nov		Data Privacy	Guest Speaker: Brian Croll (Global VP of Product Marketing, Apple)	Poll Question
23	5-Dec		AI Ethics	Guest Speaker: Alex Hanna (Director, Distributed AI Research Institute)	Poll Question
24	7-Dec		Experimental Dilemmas	Meta's Role in Society (Read Case)	Poll Question

* **Blue** denotes Columbia Case.